REMARKS

A declaration under 37 CFR 1.132 by Dr. Thomas Mack, one of the inventors, accompanies this amendment.

Claims 1, 2, 8, and 18 are amended to incorporate tantalum content into the independent claims. Support for these amendments can be found, for example, in the claims as originally filed. Claims 5 and 12 are also amended for consistency with the amendments to claims 1 and 2.

The rejection of claims 1, 6 to 8, 11, and 15 – 18 under 35 USC 103(a) over Nguyen-Dinh, US Patent 4,935,072, is respectfully traversed. Claims 1 and 8 as amended require a nickel-based alloy comprising 2.0 to 2.6% tantalum. All of the compositions described in Nguyen-Dinh appear to contain at least 7% tantalum. Reconsideration and withdrawal of this rejection are respectfully requested.

The rejection of claims 1, 2, and 4 – 18 under 35 USC 103(a) over Bornstein et al., WO 93/24683, is also respectfully traversed. The broad ranges of Bornstein et al. have a narrow overlap with the compositions of the claimed invention. For example, the claimed invention requires a tantalum content of 2.0 to 2.6%, while Bornstein et al. broadly describes compositions having a tantalum content of 2.5 to 13%. However, the claimed invention provides a number of unexpected advantages over the broad disclosure of Bornstein et al. A number of the advantages of the alloys of the claimed invention are detailed in the declaration of Dr. Thomas Mack that is submitted with this amendment.

Table 1 of the declaration provides a listing of the alloys discussed in the declaration. The LEK94 alloys correspond to alloys of the claimed invention. The experimental alloys (referred to as SX1 – SX6 and SXref) represent additional alloys that have been investigated by the Applicants. Note that not all of the experimental "SX" alloys correspond to the claimed invention. In particular, compositions SX1-A, SX1-B, SX1-C, and SX2 have rhenium and/or tungsten values outside of the claimed invention. Additionally, the alloy SXref is not a composition according to the claimed invention. Rather, SXref corresponds

to a composition in the middle of the "most preferred" ranges of Bornstein et al., as described at page 5, lines 29 – 33 of Bornstein et al. The "Bornstein et al." alloys in Table 1 represent compositions at the upper and lower limits as disclosed in Bornstein et al., along with a composition similar to SXref as described above. The Nguyen-Dinh et al. compositions were selected in a similar manner.

First, the claimed invention requires an alloy with a weight ratio of tungsten to rhenium of 1.1 to 1.6. While the composition ranges described in Bornstein et al. are broad enough to include compositions having this weight ratio, Bornstein et al. provides no teaching or suggestion that this weight ratio is important. As shown in Figure 5 of the declaration, a weight ratio of tungsten to rhenium of 1.1 to 1.6 corresponds to alloys with improved creep strength for two different measures of creep strength.

The density of the alloys of the claimed invention is also significantly lower than the alloys suggested by Bornstein et al. As shown in the declaration, the narrow range of compositions of the claimed invention produces alloys with densities between 8.11 and 8.17 g/cm^2. (See the LEK94 alloys and Experimental alloys SX3 – SX6.) Thus, even though the claimed alloys incorporate effective amounts of the density increasing elements tungsten, rhenium, and tantalum, the density of the overall alloy remains low. For comparison, densities were calculated for the Bornstein et al. alloys shown in Table 1. These representative compositions from Bornstein et al. have densities of 8.45 g/cm^2 or greater. Thus, the alloys of the claimed invention show a reduction in density of 3% or greater relative to the alloys of Bornstein et al. This allows for the construction of lighter components while retaining desired mechanical properties.

The claimed invention also requires alloys having at least 2.3% Re content. Figure 2 of the declaration shows that alloys with Re content below 2.3% have significantly lower creep strengths. By contrast, Bornstein et al.

provides no indication of the importance of having at least 2.3% Re for maintaining the creep strength of the alloy.

Still another advantage of the claimed invention is a reduction or elimination of TCP phases, such as "needles", from the alloy structure. Figure 9 of the declaration shows electron micrographs comparing a composition according to the claimed invention and the SXref composition. While both compositions exhibit some TCP phase formation at the interface with the coating layer, the alloy of the claimed invention shows little or no TCP phase formation in the bulk material. On the other hand, the SXref composition, corresponding to the "most preferred" range of Bornstein et al., shows significant amounts of TCP phase within the bulk material.

Furthermore, as shown in the declaration, the claimed invention provides alloys having high thermal stability, an improved heat treatment window, and the absence of a low melting diffusion zone during coating. Thus, for at least the above reasons, reconsideration and withdrawal of the rejection are respectfully requested.

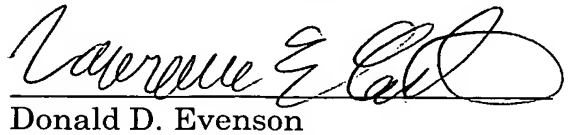
In view of the foregoing amendments and remarks, the application is respectfully submitted to be in condition for allowance, and prompt, favorable action thereon is earnestly solicited.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #038741.50807).

Respectfully submitted,

January 30, 2004



Donald D. Evenson
Registration No. 26,160
Lawrence E. Carter
Registration No. 51,532

CROWELL & MORING LLP
Intellectual Property Group
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844